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Report of the Scientific and Technical Subcommittee on its fifty-first session, held in Vienna from 10 to 21 February 2014

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I. Introduction

1. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its fifty-first session at the United Nations Office at Vienna from 10 to 21 February 2014, under the chairmanship of Előd Both (Hungary).

2. The Subcommittee held 19 meetings.

A. Attendance

3. Representatives of the following 63 member States of the Committee attended the session: Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bolivia (Plurinational State of), Brazil, Burkina Faso, Canada, Chile, China, Colombia, Costa Rica, Cuba, Czech Republic, Ecuador, Egypt, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Jordan, Kazakhstan, Kenya, Lebanon, Libya, Malaysia, Mexico, Morocco, Netherlands, Nicaragua, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Slovakia, South Africa, Spain, Sudan, Switzerland, Syrian Arab Republic, Tunisia, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Venezuela (Bolivarian Republic of) and Viet Nam.

4. At its 796th meeting, on 10 February, the Subcommittee decided to invite, at their request, observers for the Dominican Republic, Guatemala, Israel, Luxembourg, Oman, Panama and the United Arab Emirates to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status.

5. At the same meeting, the Subcommittee decided to invite, at its request, the observer for the Sovereign Military Order of Malta to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status.

6. Also at that same meeting, the Subcommittee decided to invite, at its request, the observer for the European Union to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status.

7. Observers for the Economic and Social Commission for Western Asia, the International Civil Aviation Organization (ICAO) and the International Telecommunication Union (ITU) attended the session.

8. The session was attended by observers for the following intergovernmental organizations with permanent observer status with the Committee: Asia-Pacific Space Cooperation Organization (APSCO), European Organisation for Astronomical Research in the Southern Hemisphere (ESO), European Space Agency (ESA), European Telecommunications Satellite Organization (EUTELSAT-IGO), Inter-Islamic Network on Space Sciences and Technology (ISNET), International Mobile Satellite Organization (IMSO), International Telecommunications Satellite

Organization (ITSO) and Regional Centre for Remote Sensing of North African States (CRTEAN).

9. The session was also attended by observers for the following non-governmental organizations having permanent observer status with the Committee: Association of Space Explorers (ASE), EURISY, European Space Policy Institute (ESPI), International Academy of Astronautics (IAA), International Association for the Advancement of Space Safety (IAASS), International Astronautical Federation (IAF), International Society for Photogrammetry and Remote Sensing (ISPRS), International Space University (ISU), Prince Sultan bin Abdulaziz International Prize for Water (PSIPW), Scientific Committee on Solar-Terrestrial Physics (SCOSTEP), Secure World Foundation (SWF), Space Generation Advisory Council (SGAC) and World Space Week Association (WSWA).

10. The Subcommittee took note of the application of Luxembourg for membership in the Committee (A/AC.105/C.1/2014/CRP.4).

11. The Subcommittee also took note of the application by the African Association of Remote Sensing of the Environment (AARSE) for permanent observer status with the Committee (A/AC.105/C.1/2014/CRP.5).

12. A list of the representatives of States, United Nations entities and other international organizations attending the session is contained in A/AC.105/C.1/2014/INF/43 and Corr.1.

B. Adoption of the agenda

13. At its 796th meeting, on 10 February, the Subcommittee adopted the following agenda:

1. Adoption of the agenda.
2. Election of the Chair.
3. Statement by the Chair.
4. General exchange of views and introduction of reports submitted on national activities.
5. United Nations Programme on Space Applications.
6. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda.
7. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment.
8. Space debris.
9. Space-system-based disaster management support.
10. Recent developments in global navigation satellite systems.
11. Space weather.

12. Near-Earth objects.

13. Use of nuclear power sources in outer space.

14. Long-term sustainability of outer space activities.

15. Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union.

16. Draft provisional agenda for the fifty-second session of the Scientific and Technical Subcommittee.

17. Report to the Committee on the Peaceful Uses of Outer Space.

C. Election of the Chair

14. At its 796th meeting, the Subcommittee elected Mr. Előd Both (Hungary) Chair for the period 2014-2015, pursuant to General Assembly resolution 68/75.

D. General statements

15. Statements were made by representatives of the following member States during the general exchange of views: Algeria, Argentina, Austria, Azerbaijan, Belgium, Brazil, Canada, China, Colombia, Costa Rica, Cuba, Czech Republic, France, Germany, India, Indonesia, Italy, Iran (Islamic Republic of), Japan, Kenya, Libya, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Poland, Republic of Korea, Romania, Russian Federation, South Africa, Spain, Switzerland, Thailand, Ukraine, United States, Venezuela (Bolivarian Republic of) and Viet Nam. A statement was also made by the representative of Nicaragua on behalf of the Group of Latin American and Caribbean States. General statements were also made by the observers for the United Arab Emirates, as well as APSCO, ESA, ESPI, EURISY, IAF, ISNET, SGAC, SWF, PSIPW and WSWA.

16. The Subcommittee welcomed the election of Előd Both as Chair for a two-year term, starting in 2014. The Subcommittee expressed its appreciation to the outgoing Chair, Félix Clementino Menicocci (Argentina), for his leadership and contribution to furthering the achievements of the Subcommittee during his term of office.

17. The Subcommittee welcomed Belarus and Ghana as new members of the Committee on the Peaceful Uses of Outer Space. ISNET was welcomed as the most recent permanent observer of the Committee.

18. At the 796th meeting, the Chair made a statement outlining the work of the Subcommittee at its current session. The Chair recalled the important role of women in the scientific and related socioeconomic fields of societal development. He also emphasized the role of regional and interregional cooperation in space activities and called for closer coordination between the Committee and other intergovernmental bodies involved in the global development agenda.

19. Also at the 796th meeting, the Officer-in-Charge of the Office for Outer Space Affairs of the Secretariat made a statement reviewing the work programme of the Office and the need for additional resources to be able to successfully perform the envisaged responsibilities in the coming years.

20. The Subcommittee observed a minute of silence to mark the recent passing of Vladimír Kopal of the Czech Republic, who had been a longstanding contributor to the work of the Committee and to the development of international space law.

21. The Subcommittee noted that the 2014 International Space Exploration Forum had taken place in Washington in January, hosted by the United States in collaboration with the International Academy of Astronautics, and which followed up on the previous dialogue initiated by the European Commission and ESA, held in Italy in 2011. The Subcommittee noted that a large number of States had attended the Forum and emphasized the importance of further advancement of exploration and utilization of outer space for the benefit of humankind.

22. Some delegations reaffirmed the commitment of their countries to the peaceful use and exploration of outer space and emphasized the following principles: equal and non-discriminatory access to outer space and equal conditions for all States, irrespective of their level of scientific, technical and economic development; non-appropriation of outer space, including the Moon and other celestial bodies, by claim of sovereignty, use, occupation or any other means; the non-militarization of outer space, the non-placement of weapons in outer space, and its strict use for the improvement of living conditions and peace on the planet; and regional cooperation to promote the development of space activities.

23. Some delegations expressed the view that, given the impact of space activities on human life and the environment, there should be greater coordination and interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to promote the establishment of binding international norms addressing issues such as space debris and the use of nuclear power sources in outer space, which were critical issues in the use and exploration of outer space.

24. Some delegations expressed the view that developing countries should benefit from space technologies, in particular to support their social and economic development; that it was necessary to promote cooperation to facilitate data exchange and the transfer of technology among States; and that training of scientists in developing countries was crucial for the free flow of scientific information and data exchange, increased capacity-building and the sharing of knowledge.

25. Some delegations expressed the view that any initiative related to the use of outer space should be addressed by the Committee and that the discussion within multilateral organizations with specific mandates was an essential condition of the development of binding legal instruments that contributed to the improvement of space law and that would allow the equal participation of all States. Those delegations were of the view that in relation to outer space, issues of disarmament, international cooperation and space debris could not be subject to non-binding agreements negotiated outside the framework of the United Nations.

26. The Subcommittee heard the following scientific and technical presentations:

(a) "The progress and achievement of Chang'e 3", by the representative of China;

(b) "Progress on calibration and validation for quantitative remote sensing in China", by the representative of China;

(c) "French technical regulations for space operations", by the representative of France;

(d) "Recent Indian space missions: update as of February 2014", by the representative of India;

(e) "Asia-Pacific Regional Space Agency Forum in 2013 and 2014: renovating for a new era", by the representative of Japan;

(f) "The Space Generation Congress 2013: perspectives from university students and young professionals in the space sector", by the observer for SGAC;

(g) "Cassini: a remarkable example of international cooperation in planetary exploration", by the representative of Italy;

(h) "Status of the United Nations-declared World Space Week", by the observer for WSWA;

(i) "Benefits of the International Space Station", by the representative of the United States;

(j) "The Brazilian sounding rocket VSB-30: meeting the Brazilian Space Programme and the Committee on the Peaceful Use of Outer Space objectives", by the representative of Brazil;

(k) "Thirty years of space geodesy at the Italian Space Agency", by the representative of Italy;

(l) "Humans on Mars: results of the Austrian multinational Mars landing simulation", by the representative of Austria;

(m) "Space activities of Luxembourg: an overview in relation to the application for membership in the United Nations Committee on the Peaceful Uses of Outer Space", by the representative of Luxembourg;

(n) "Mission of Pazhuhesh, carrier of the second Iranian biospace capsule", by the representative of the Islamic Republic of Iran.

27. The Subcommittee expressed its gratitude to the organizers of the following events held on the margins of the current session of the Subcommittee:

(a) Expert meeting on "Improving space weather forecasting in the next decade", organized by the United States and the National Aeronautics and Space Administration (NASA);

(b) Seminar entitled "Your country wants to do more in space? A toolbox", hosted by ESPI;

(c) Seminar on "Space and sustainable development: space technology and research for global health", organized by Japan and the World Health Organization (WHO);

(d) Expert meeting on "International Space Station benefits for health", organized by the Office for Outer Space Affairs in collaboration with WHO.

28. The Subcommittee noted with appreciation that the exhibition named "China's space activities" had been held in the Vienna International Centre from 10 to 21 February 2014.

E. National reports

29. The Subcommittee took note with appreciation of the reports submitted by Member States (see A/AC.105/1058 and Add.1, A/AC.105/C.1/2014/CRP.10, A/AC.105/C.1/2014/CRP.11 and A/AC.105/C.1/2014/CRP.25) for its consideration under agenda item 4, "General exchange of views and introduction of reports submitted on national activities". The Subcommittee recommended that the Secretariat continue to invite Member States to submit annual reports on their space activities.

F. Symposium

30. On 17 February, the Office for Outer Space Affairs organized a symposium on the theme "Commercial applications of global navigation satellite systems", which was moderated by Xiancheng Ding of China.

31. The presentations given at the symposium included the following: "The Global Positioning System and its applications", by Tom Stansell of Stansell Consulting; "The current status and future directions of commercial applications of GLONASS/GNSS in the Russian Federation", by Andrey Kupriyanov of the GLONASS/GNSS Forum Association; "Progress of Beidou/GNSS application", by Miao Tian of the China Satellite Navigation Office; "GALILEO commercial application prospective and critical issues", by Giuseppe Viriglio of Telespazio SpA; and "Project overview of the Quasi-Zenith Satellite System", by Yoshiyuki Murai of QZS System Services Inc.

G. Adoption of the report of the Scientific and Technical Subcommittee

32. After considering the items before it, the Subcommittee, at its 814th meeting, on 21 February 2014, adopted its report to the Committee on the Peaceful Uses of Outer Space, containing its views and recommendations, as set out in the paragraphs below.

II. United Nations Programme on Space Applications

33. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 5, "United Nations Programme on Space Applications".

34. At the 806th meeting, the Expert on Space Applications made a statement outlining the activities carried out and planned under the United Nations Programme on Space Applications.

35. The representatives of Brazil, Canada, China, Germany, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Mexico, Nigeria, Pakistan, the Republic of Korea and the Russian Federation made statements under agenda item 5. A statement was also made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

36. The Subcommittee heard the following scientific and technical presentations:

(a) "Education programmes for the new Asia-Pacific Centre in China", by the representative of China;

(b) "DropTES: a new fellowship programme of the Office for Outer Space Affairs at the Bremen Drop Tower", by the representative of Germany;

(c) "JAXA human spaceflight activities, contributions and Asian collaboration through the International Space Station/Kibo", by the representative of Japan;

(d) "Opportunities for partnerships with the Office for Outer Space Affairs", by the Office for Outer Space Affairs.

A. Activities of the United Nations Programme on Space Applications

37. The Subcommittee had before it the report of the Expert on Space Applications, outlining the mandate and orientation of the United Nations Programme on Space Applications (see A/AC.105/1062, paras. 2-10). The Subcommittee noted that the Programme for 2013 had been carried out satisfactorily and commended the work accomplished by the Office under the Programme.

38. The Subcommittee noted with appreciation the voluntary contributions (cash and in-kind) provided by various Member States and organizations for 2013 (see A/AC.105/1062, paras. 50-51).

39. The Subcommittee noted that the priority areas of the Programme were environmental monitoring, natural resource management, satellite communications for tele-education and telemedicine applications, disaster risk reduction, the use of global navigation satellite systems, the Basic Space Science Initiative, space law, climate change, the Basic Space Technology Initiative and the Human Space Technology Initiative.

1. Year 2013

Meetings, seminars, symposiums, training courses and workshops

40. With regard to the activities of the United Nations Programme on Space Applications carried out in 2013, the Subcommittee expressed its appreciation to the following Governments and entities for co-sponsoring the various workshops, symposiums and training courses held within the framework of the Programme, as

referred to in the report of the Expert on Space Applications (A/AC.105/1062, para. 47 and annex I):

(a) The Governments of Austria, Belarus, China, Croatia, Indonesia, Pakistan, the United Arab Emirates and the United States;

(b) Belarusian State University; China Manned Space Agency; Chinese Society of Astronautics; Emirates Institution for Advanced Science and Technology; Faculty of Maritime Studies of the University of Rijeka, Croatia; Institute for Space Research of the Austrian Academy of Sciences; National Institute of Aeronautics and Space of Indonesia; and Space and Upper Atmosphere Research Commission of Pakistan;

(c) Inter-Islamic Network on Space Sciences and Technology (ISNET), International Committee on Global Navigation Satellite Systems (ICG), ESA and International Astronautical Federation.

Long-term fellowships for in-depth training

41. The Subcommittee expressed its appreciation to the Government of Italy, which, through the Politecnico di Torino and the Istituto Superiore Mario Boella and with the collaboration of the Istituto Elettrotecnico Nazionale Galileo Ferraris, had continued to provide five 12-month fellowships for postgraduate studies in global navigation satellite systems (GNSS) and related applications.

42. The Subcommittee expressed its appreciation to the Government of Japan for expanding the United Nations/Japan Long-term Fellowship Programme on Nanosatellite Technologies. Under that programme, the Kyushu Institute of Technology annually accepted up to four doctoral students and two Master's degree students for postgraduate study.

43. The Subcommittee expressed its appreciation to the Government of Germany, which, in collaboration with the Centre of Applied Space Technology and Microgravity and the German Aerospace Center (DLR), introduced a new fellowship programme that provided a research team with the opportunity to conduct its own microgravity experiments at the Bremen Drop Tower in Germany.

44. The Subcommittee noted with appreciation the successful launch of the Zero-Gravity Instrument Project as part of the Human Space Technology Initiative of the Programme. The Project contributed to capacity-building in education and research on microgravity, in particular in developing countries.

Technical advisory services

45. The Subcommittee noted with appreciation the technical advisory services provided under the United Nations Programme on Space Applications in support of activities promoting regional and international cooperation in space applications, as referred to in the report of the Expert on Space Applications (A/AC.105/1062, paras. 38-46).

2. Year 2014

Meetings, seminars, symposiums, training courses and workshops

46. The Subcommittee recommended the approval of the following programme of meetings, seminars, symposiums, training courses and workshops for 2014:

(a) United Nations Expert Meeting on the International Space Station Benefits for Health, to be held in Vienna on 19 and 20 February;

(b) United Nations/Morocco International Conference on the Use of Space Technology for Water Management, to be held in Rabat from 1 to 4 April;

(c) United Nations/Russian Federation Workshop on the Application of Global Navigation Satellite Systems, to be held in Krasnoyarsk, Russian Federation, from 26-30 May;

(d) United Nations/Austria Symposium on Space Science, to be held in Graz, Austria, in September;

(e) United Nations/International Astronautical Federation Workshop on Space Technology for Socioeconomic Benefits, to be held in Toronto, Canada, from 26 to 28 September;

(f) United Nations/Ecuador Workshop on Space Technology for Sustainable Development in Mountain Regions of the Andean Countries, to be held in Quito from 13 to 17 October;

(g) United Nations/Mexico Symposium on Basic Space Technology, to be held in Ensenada, Mexico, from 20 to 23 October;

(h) United Nations/China Workshop on Space Law, co-organized with APSCO, to be held in Beijing in November;

(i) United Nations/Abdus Salam International Centre for Theoretical Physics Workshop on the Use of Global Navigation Satellite Systems for Scientific Applications, to be held in Trieste, Italy, from 1 to 5 December.

B. Regional and interregional cooperation

47. The Subcommittee noted that the schedule of nine-month postgraduate courses for the period 2012-2014 offered by the regional centres for space science and technology education, affiliated to the United Nations, was annexed to the report of the Expert on Space Applications (A/AC.105/1062, annex III).

48. The Subcommittee recalled that the General Assembly, in its resolution 68/75, had noted with satisfaction the progress on the establishment of a new regional centre for space science and technology education in Asia and the Pacific located at Beihang University in Beijing, as proposed by the Government of China, in particular the positive conclusion of an evaluation mission to Beihang University facilitated by the Office for Outer Space Affairs in September 2013.

49. The Subcommittee noted that the evaluation mission had resulted in the recommendation to accept the offer of the Government of China to establish a regional centre hosted at Beihang University.

50. The Subcommittee recalled that the General Assembly, in its resolution 68/75, had emphasized the importance of regional and interregional cooperation in the field of space activities to assist States in the development of their space capabilities and contribute to the achievement of the goals of the United Nations Millennium Declaration, and had noted in that regard the importance of the equal participation of women in all fields of science and technology.

51. The Subcommittee noted that the twentieth session of the Asia-Pacific Regional Space Agency Forum (APRSAF) had been held in Hanoi from 3 to 6 December 2013, with the theme "Values from space: 20 years of Asia-Pacific experiences". The twenty-first session of APRSAF would be held in Tokyo in 2014.

52. The Subcommittee also noted that the African Leadership Conference on Space Science and Technology for Sustainable Development took place in Accra from 3 to 5 December 2013, with a focus on capacity-building, knowledge-sharing and the joint participation of African countries in mutually beneficial projects in the area of space science and technology for sustainable development, including the promotion of adherence to the outer space treaties by spacefaring and non-spacefaring countries.

53. The Subcommittee noted with appreciation the support and contribution of the Office for Outer Space Affairs and SWF to the organization of the African Leadership Conference on Space Science and Technology for Sustainable Development.

54. The Subcommittee also noted that the seventh meeting of the Council of APSCO had been held in Beijing on 5 July 2013, at which it reviewed the progress on APSCO projects.

55. The Subcommittee noted that the pro tempore secretariat of the Sixth Space Conference of the Americas was continuing the implementation of the Pachuca Declaration, adopted at the Sixth Conference, held in Pachuca, Mexico, from 15 to 19 November 2010.

56. The Subcommittee took note of the request made by the Group of Latin American and Caribbean States that the Subcommittee give a positive assessment of the implementation of activities under the United Nations Programme on Space Applications in the Latin American and Caribbean region and strengthen regional and interregional cooperation measures.

III. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda

57. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 6, "Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda".

58. The representatives of Austria, Canada, Egypt, Germany, Japan and Nigeria made statements under agenda item 6. During the general exchange of views,

statements relating to the item were made by representatives of other member States.

59. The Subcommittee heard the following scientific and technical presentations:

(a) "The use of space technologies for the implementation of space data infrastructure of the Ministry of Agriculture (IDE-MINAGRI) of Chile", by the representative of Chile;

(b) "The start of the Q/V Band Experimental Programme: new possibilities for fast telecommunication infrastructure development", by the representative of Italy;

(c) "BRITE nanosatellite mission: one year in orbit", by the representative of Austria;

(d) "Humanitarian telemedicine: potential telemedicine applications to assist developing countries in primary and secondary care", by the observer for ESPI;

(e) "Affordable Microsatellite-based Internet Access and Environmental Monitoring (AMBIEnT)", by the observer for the International Space University;

(f) "Kenyan Coast Observations through Affordable Space Technology Applications (KOASTAL)", by the observer for the International Space University.

60. The Subcommittee had before it the following:

(a) Conference room paper entitled "New web page on space and development" (A/AC.105/C.1/2014/CRP.12);

(b) Conference room paper entitled "Update on the recent developments in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda" (A/AC.105/C.1/2014/CRP.21);

(c) Discussion paper submitted by Japan entitled "Draft proposed workplan for a mechanism of cooperative deliberation for 'space and sustainable development': bridging the Committee on the Peaceful Uses of Outer Space and the Scientific and Technical Subcommittee" (A/AC.105/C.1/2014/CRP.22);

(d) Note by the Secretariat containing the progress report of the Open Working Group of the General Assembly on Sustainable Development Goals (A/AC.105/C.1/2014/CRP.23);

(e) Discussion paper submitted by Canada entitled "Global health" (A/AC.105/C.1/2014/CRP.24).

61. The Subcommittee recalled that the General Assembly, in its resolution 68/75, reiterated that the benefits of space technology and its applications should continue to be brought to the attention, in particular, of the major United Nations conferences and summits for economic, social and cultural development and related fields and that the use of space technology should be promoted in efforts towards achieving the objectives of those conferences and summits, including implementing the Millennium Declaration and contributing to the post-2015 development agenda process.

62. The Subcommittee noted the effective role of space science and technology and their applications and geospatial information in areas such as tele-health and

tele-epidemiology, tele-education, disaster management, environmental protection, urban and rural development and Earth monitoring, as well as their contribution to economic, social and cultural development.

63. The Subcommittee recalled that in paragraph 274 of the outcome document of the United Nations Conference on Sustainable Development, entitled "The future we want", Heads of State and Government recognized the importance of space-technology-based data, in situ monitoring and reliable geospatial information for sustainable development policymaking, programming and project operations.

64. The Subcommittee expressed its gratitude to the delegation of Japan for organizing a seminar entitled "Space and sustainable development: space technology and research for global health", organized in cooperation with WHO on the margins of the current session of the Subcommittee.

65. The Subcommittee noted with appreciation that the eleventh open informal session of the Inter-Agency Meeting on Outer Space Activities (UN-Space) would be organized by the Office for Outer Space Affairs on 14 May 2014 in New York. The Subcommittee noted with satisfaction that the session of UN-Space would be held in conjunction with the meeting of the United Nations Geographical Information Working Group, to be held from 14 to 16 May 2014.

66. The Subcommittee noted that the high-level event of the President of the General Assembly entitled "Contributions of North-South, South-South, triangular cooperation and information and communication technologies for development to the implementation of the post-2015 development agenda", was scheduled for 20 and 21 May 2014.

67. The Working Group of the Whole was reconvened under the chairmanship of V. K. Dadhwal (India), in accordance with paragraph 7 of General Assembly resolution 68/75. At its 813th meeting, on 20 February, the Subcommittee endorsed the report of the Working Group of the Whole, which is contained in annex I to the present report.

IV. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment

68. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 7, "Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment".

69. The representatives of Brazil, Canada, China, Egypt, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Mexico, the Republic of Korea, the Russian Federation, the Syrian Arab Republic and the United States made statements under the agenda item. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

70. The Subcommittee heard the following scientific and technical presentations:

(a) "Belarusian space system for Earth remote sensing", by the representative of Belarus;

(b) "China high-resolution Earth observation system and its latest developments", by the representative of China;

(c) "Global Precipitation Measurement: an international mission for measuring global precipitation", by the representative of Japan;

(d) "General organization of remote sensing activities in Syria", by the representative of the Syrian Arab Republic;

(e) "National Oceanic and Atmospheric Administration meteorological satellite update", by the representative of the United States;

(f) "The Israeli commercial remote sensing capabilities and their role in civil scenarios", by the representative of Israel.

71. In the course of the discussions, delegations reviewed national and cooperative programmes on remote sensing. Examples were given of national, bilateral, regional and international programmes to further socioeconomic and sustainable development, notably in the following areas: agriculture and fishery; monitoring climate change; disaster management; hydrology; managing ecosystems and natural resources; monitoring air and water quality; forest fire detection and monitoring; archaeological research; mapping biodiversity resources, coastal zones, watershed development and land use; ice-cover monitoring; oceanography; volcanology; rural development and urban planning; geoportals and e-learning systems; safety and public health; and food security and crop yield quantification.

72. The Subcommittee recognized that comprehensive, coordinated and sustained Earth observation systems were essential for the benefit of humankind and that significant efforts were being made to build the capacity of developing countries in using Earth observations to improve quality of life and advance their socioeconomic development.

73. The Subcommittee noted the increased availability of space-based data at little or no cost, including remote sensing data, made available from the China-Brazil Earth resources satellites, the SAC-C international mission, Landsat of the United States, the greenhouse gases observing satellites of Japan, OCEANSAT-2 of India and the Megha-Tropiques Indian-French joint satellite mission.

74. The Subcommittee took note of the number of continued launches of Earth observation satellites and the innovative research conducted using such satellites, data from which could be used to develop advanced, global-integrated Earth-system models.

75. The Subcommittee noted that a growing number of developing countries had been actively developing and deploying their own remote sensing satellite systems and utilizing space-based data to advance socioeconomic development.

76. The Subcommittee recalled the important role played by organizations and initiatives such as APRSAF and Sentinel Asia and its Space Applications for the Environment initiative, the Group on Earth Observations (GEO) and the Committee on Earth Observation Satellites (CEOS) and its virtual constellations for the GEO

initiative in promoting international and regional cooperation in the use of remote sensing technology, in particular for the benefit of developing countries.

77. The Subcommittee noted the progress made by GEO in the implementation of the Global Earth Observation System of Systems (GEOSS) and other initiatives, such as those on forest carbon tracking, climate and agriculture monitoring, development and integration of observation networks in cold regions and capacity-building efforts for the expansion of access to and use of Earth observation in developing countries. The Subcommittee also took note of the 6th GEOSS Asia-Pacific Symposium, held in Ahmedabad, India, in February 2013; the first GEOSS Joint Asia-Africa Water Cycle Symposium, organized by the University of Tokyo and GEO in Tokyo in November 2013; and the GEO plenary session, hosted by Switzerland in Geneva in January 2014.

78. The Subcommittee noted the successful conclusion of the 27th plenary meeting of CEOS, hosted by Canada in November 2013, at which CEOS adopted as a mission statement to coordinate international civil-based Earth observation programmes and to promote the exchange of data to optimize societal benefits and informed decisions for securing a prosperous and sustainable future for humankind. The Subcommittee also noted that the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) had taken up the chairmanship of CEOS for 2014 and would host its next plenary meeting in November 2014 and that JAXA would take up the chairmanship of CEOS for 2015. The Subcommittee further noted that the 29th meeting of the CEOS Strategic Implementation Team would be held in Toulouse, France on 9 and 10 April 2014.

79. The view was expressed that all States should have equal access to remote sensing technology and the data produced by remote sensing technology, at a reasonable cost or at no cost, in accordance with the Principles Relating to Remote Sensing of the Earth from Outer Space.

80. The Subcommittee took note of the importance of data democracy policies in empowering users in developing countries so that they can make full use of remote sensing applications for the benefit of their own societies.

V. Space debris

81. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 8, "Space debris".

82. The representatives of Canada, China, Egypt, Germany, India, Japan, Pakistan, the Republic of Korea, Switzerland, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 8. A statement was made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

83. The Subcommittee heard the following scientific and technical presentations:

(a) "Overview of the 2013 space debris activities in France", by the representative of France;

(b) "Space debris mitigation activities in Indonesia", by the representative of Indonesia;

(c) "International Scientific Optical Network (ISON) activities on highly elliptical orbit and geosynchronous orbit observations and analysis in 2013", by the representative of the Russian Federation;

(d) "Advances in Canada's contributions to space situational awareness", by the representative of Canada;

(e) "United States space debris environment, operations and modelling updates", by the representative of the United States;

(f) "Twenty years of the Inter-Agency Space Debris Coordination Committee", by the representative of China;

(g) "Propellantless deorbiting of space debris by bare electrodynamic tethers", by the representative of Spain;

(h) "European Space Agency space debris mitigation", by the observer for ESA.

84. The Subcommittee had before it information on national research on space debris, the safety of space objects with nuclear power sources on board and problems relating to the collision of such objects with space debris, containing replies received from Member States and international organizations on the issue (A/AC.105/C.1/108, A/AC.105/C.1/2014/CRP.6, A/AC.105/C.1/2014/CRP.7 and A/AC.105/C.1/2014/CRP.8).

85. The Subcommittee expressed concern at the increasing amount of space debris and encouraged those States which had not yet done so to consider voluntary implementation of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space.

86. The Subcommittee agreed that States, in particular spacefaring nations, should pay greater attention to the problem of collisions of space objects, including those with nuclear power sources on board, with space debris and to other aspects of space debris, including its re-entry into the atmosphere.

87. The Subcommittee noted with satisfaction that some States were implementing space debris mitigation measures consistent with the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space and/or the Inter-Agency Space Debris Coordination Committee (IADC) Space Debris Mitigation Guidelines, and that other States had developed their own space debris mitigation standards based on those guidelines.

88. The Subcommittee noted that other States were using the IADC Guidelines and the European Code of Conduct for Space Debris Mitigation as reference points in their regulatory frameworks for national space activities. The Subcommittee also noted that other States had cooperated, in the framework of the ESA space situational awareness programme, to address the issue of space debris.

89. The Subcommittee noted with appreciation that States had adopted a number of approaches and concrete actions to mitigate space debris, including the improvement of the design of launch vehicles and spacecraft, the reorbiting of satellites, passivation, end-of-life operations and the development of specific software and models for space debris mitigation.

90. The Subcommittee noted that research was being conducted in the areas of technology for space debris observation and continuous monitoring, space debris re-entry prediction, collision avoidance and modelling of collision probability, in-orbit robotic servicing of satellites, and technologies to protect space systems from space debris and to limit the creation of additional space debris.

91. Some delegations expressed the view that information on actions to reduce the creation of space debris should be made available to the Committee, in particular by those States which were largely responsible for creating space debris and by the States that had the capacity to take action with regard to space debris mitigation.

92. Some delegations expressed the view that States should take action to improve technology for monitoring space debris as a matter of priority.

93. Some delegations expressed the view that outcomes of the work of working groups of the Subcommittee, such as the Safety Framework for Nuclear Power Source Applications in Outer Space and the Space Debris Mitigation Guidelines of the Committee, should be officially presented to the Legal Subcommittee for examination.

94. Some delegations expressed the view that all relevant information related to the re-entry of space debris into the Earth's atmosphere should be reported diligently and expeditiously to countries that might be affected.

95. Some delegations expressed the view that developing countries should benefit from technical assistance in space debris monitoring provided by spacefaring nations.

96. Some delegations expressed the view that countries with highly advanced space programmes should assume their responsibilities in the area of space debris to ensure that the mitigation and removal costs were not passed on to countries with emerging space programmes, and that a solution should be sought in particular for space debris of large dimensions that could potentially generate multiple fragments, which would be costly to remove.

97. Some delegations expressed the view that the exchange of knowledge and data among States was essential for meaningful mitigation strategies and remediation measures.

98. The view was expressed that critical control measures should be applied for the control and the prevention of the generation of space debris.

99. The view was expressed that since space debris was created by the past operations of spacefaring countries, those countries should assist countries with emerging space programmes in the implementation of space debris mitigation measures through the provision of conjunction assessment risk analysis systems and situational awareness systems for the live monitoring of space objects, and in arranging financing to absorb additional costs incurred.

100. Some delegations expressed the view that it was necessary to continue improving the Space Debris Mitigation Guidelines of the Committee and that the Scientific and Technical Subcommittee and the Legal Subcommittee should cooperate with the aim of developing legally binding rules relating to space debris, including debris derived from space platforms with nuclear power sources on board.

101. The Subcommittee noted that Canada, the Czech Republic and Germany had initiated the development of a compendium of standards adopted by States and international organizations to mitigate space debris — and had invited member States to contribute to it — with a view to presenting the compendium to the Legal Subcommittee at its fifty-third session, in 2014.

102. The Subcommittee noted that the General Assembly, in its resolution 68/75, had called for the continuation of national research on the problem of collisions of space objects, including those with nuclear power sources, with space debris, for the development of improved technology for the monitoring of space debris and for the compilation and dissemination of data on space debris and had agreed that international cooperation was needed to expand appropriate and affordable strategies to minimize the impact of space debris on future space missions.

103. The Subcommittee agreed that research on space debris should continue and that Member States should make available to all interested parties the results of that research, including information on practices that had proved effective in minimizing the creation of space debris.

104. The Subcommittee agreed that Member States and international organizations with permanent observer status with the Committee should be invited to provide reports on research on space debris, the safety of space objects with nuclear power sources on board, problems relating to the collision of such space objects with space debris and ways in which debris mitigation guidelines were being implemented.

VI. Space-system-based disaster management support

105. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 9, "Space-system-based disaster management support".

106. The representatives of Chile, China, Egypt, France, Germany, India, Indonesia, Japan, Mexico, Pakistan and the United States made statements under agenda item 9. A statement was made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. A representative of the Office for Outer Space Affairs made a statement on the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER). During the general exchange of views, statements relating to the item were also made by representatives of other member States.

107. The Subcommittee heard the following scientific and technical presentations:

(a) "Space information technology application for disaster reduction", by the representative of China;

(b) "Use of space inputs in recent major disasters in India", by the representative of India;

(c) "Disaster management", by the observer for the International Society for Photogrammetry and Remote Sensing;

(d) "United Nations Platform for Space-based Information for Disaster Management and Emergency Response knowledge portal: gateway to space-based

information for disaster risk management and emergency response", by a representative of the Office for Outer Space Affairs.

108. The Subcommittee had before it the following:

(a) Report on the United Nations/Germany Expert Meeting on the Use of Space-based Information in Early Warning Systems (Bonn, Germany, 25-26 June 2013) (A/AC.105/1047);

(b) Report of the Secretariat on technical advisory support activities carried out in 2013 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (A/AC.105/1056);

(c) Report on activities carried out in 2013 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (A/AC.105/1057);

(d) Report on the United Nations International Conference on Space-based Technologies for Disaster Management: Disaster Risk Identification, Assessment and Monitoring (Beijing, 23-25 October 2013) (A/AC.105/1061).

109. The Subcommittee expressed its appreciation for the efforts of the Office for Outer Space Affairs to bring the reports on the activities of UN-SPIDER in 2013 to its attention, and noted with satisfaction the progress made with regard to all activities planned in the framework of the programme, including the continuing support provided through the programme for emergency response efforts in connection with typhoon Bopha in Palau and the Philippines, typhoon Haiyan in the Philippines and the floods in northern Iraq and Baghdad.

110. The Subcommittee noted that in 2013, UN-SPIDER, with support from its network of partners, had carried out missions for advisory support in Ghana, Indonesia, Malawi and Viet Nam. Delegates noted with gratitude the training sessions held in Bangladesh, the Dominican Republic, Mozambique and the Sudan, organized as follow-up to the UN-SPIDER technical advisory missions carried out in previous years.

111. Some delegations acknowledged with appreciation the new developments with respect to the UN-SPIDER knowledge portal (www.un-spider.org), in particular the new interface in Spanish.

112. The Subcommittee took note of the technical advisory missions to be undertaken by UN-SPIDER in 2014 in Bhutan, El Salvador, Kenya and Mongolia, and noted the synergies and cross-border actions facilitated by the UN-SPIDER programme, for example, a regional workshop on early warning and monitoring of droughts in Central America, to be held in April 2014.

113. The Subcommittee welcomed planned outreach activities of UN-SPIDER to promote the use of space-based tools and information for global and regional initiatives such as the International Strategy for Disaster Reduction and the post-2015 development agenda.

114. The Subcommittee noted with satisfaction the ongoing activities of Member States that were contributing to increasing the availability and use of space-based solutions in support of disaster management and were supporting the UN-SPIDER programme, including the following activities: the launch of the high-definition

television camera system on the International Space Station, Kibo HDTV-EF, for emergency observation in the framework of the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (also called the International Charter on Space and Major Disasters); the completion by the DLR Center for Satellite-based Crisis Information (ZKI) of several operational mapping and analysis tasks for disaster events in Germany and worldwide; the promotion, through the Charter on Space and Major Disasters, of the Universal Access initiative; the progress of the Regional Visualization and Monitoring System (SERVIR) programmes in the Himalayas and Africa; and many further examples of products defined for specific and sectoral end-users at the national level. The Subcommittee also noted the contribution by France within the Satellite pour l'observation de la Terre (Spot) World Heritage programme, which had made SPOT satellite images more than five years old available for free to the public for non-commercial activities.

115. The Subcommittee noted that the International Charter on Space and Major Disasters had been activated over 400 times since its creation and 38 times in 2013, including 30 activations involving the Pléiades satellite constellation, and had already been activated 11 times in 2014. The Subcommittee noted in that regard that 50 per cent of activations in 2013 were for flood events. The Subcommittee also noted that Sentinel Asia had been activated 18 times for floods, earthquakes, landslides and forest fires in Asia.

116. Some delegations expressed the view that partnerships, international agreements and full and open data-sharing arrangements were becoming increasingly important to ensure the effective distribution of space-based data and their use by emergency managers and other responsible authorities worldwide. Various services provided by space agencies in the form of current satellite imagery or information ready for use in geographic information systems (GIS), in particular services used in flood and earthquake events, were noted.

117. The view was expressed that changes to the hydrological regime of the Nile river system could have important environmental impacts and were a matter of concern and that space-based information could be useful in evaluating and preparing for those impacts.

118. The Subcommittee took note of the expert contributions made by Member States and regional support offices in 2013 to all UN-SPIDER technical advisory missions, as well as their sharing of experiences with other interested countries.

119. The Subcommittee noted the broad interest and expert participation in the United Nations/Germany Expert Meeting on the Use of Space-based Information in Early Warning Systems, held in Bonn, Germany, on 25 and 26 June 2013, and the United Nations International Conference on Space-based Technologies for Disaster Management: Disaster Risk Identification, Assessment and Monitoring, held in Beijing on 23-25 October 2013.

120. The Subcommittee noted that the Office for Outer Space Affairs had hosted the fifth annual meeting of the regional support offices of UN-SPIDER in Vienna on 13 and 14 February 2014 to review the joint activities implemented in 2013 and to develop a joint workplan for 2014 and for the biennium 2014-2015. The Subcommittee also noted that the regional support offices in Algeria, Colombia, Iran (Islamic Republic of), Kenya, Nigeria and Ukraine had presented their initial results

on the preparation of a technical document and tutorial on recommended practices for disaster risk reduction and disaster management. Meeting participants agreed to work through an online collaborative platform on issues such as monitoring the impacts of advisory services and to identify and prepare joint project proposals and prepare and develop recommended practices for disaster risk reduction and emergency response.

121. Some delegations expressed the view that the Office for Outer Space Affairs should explore establishing further cooperation agreements with national institutions and interregional organizations involved in the management of natural disasters to develop training programmes related to the application of space technology for disaster management, particularly in developing countries.

122. The Subcommittee noted with satisfaction the signing, at the fifty-sixth session of the Committee on the Peaceful Uses of Outer Space, of an agreement between the Office for Outer Space Affairs and the Ministry for Civil Defence, Emergencies and the Elimination of Consequences of Natural Disasters of the Russian Federation, for the creation of a regional support office of UN-SPIDER.

123. The Subcommittee welcomed the fact that the 16 regional support offices of UN-SPIDER continued to successfully contribute to the activities of UN-SPIDER (see www.un-spider.org/network/regional-support-offices).

124. The Subcommittee noted with satisfaction the voluntary contributions that were being made by Member States, including cash contributions from Austria, China and Germany, and encouraged Member States to provide, on a voluntary basis, all support necessary, including financial support, to UN-SPIDER to enable it to carry out its workplan for the biennium 2014-2015.

125. The Subcommittee noted that the Government of Mexico had initiated a review of the General Law on Civil Protection in order to address disasters that could occur due to outer space phenomena and that, once adopted, the text of the law would be shared with the Subcommittee.

VII. Recent developments in global navigation satellite systems

126. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 10, "Recent developments in global navigation satellite systems", and reviewed issues related to ICG, the latest developments in the field of GNSS and new GNSS applications.

127. The representatives of Canada, China, Egypt, India, Italy, Japan, Mexico, the United Arab Emirates and the United States made statements under agenda item 10. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

128. The Subcommittee had before it the following documents:

(a) Report on the United Nations/Croatia Workshop on the Applications of Global Navigation Satellite Systems (A/AC.105/1055);

(b) Note by the Secretariat on the Eighth Meeting of the International Committee on Global Navigation Satellite Systems (A/AC.105/1059);

(c) Report of the Secretariat on activities carried out in 2013 in the framework of the workplan of the International Committee on Global Navigation Satellite Systems (A/AC.105/1060).

129. The Subcommittee noted with appreciation the organization of a symposium on the theme "Commercial applications of global navigation satellite systems", which focused on important current topics for GNSS data providers and users.

130. The Subcommittee was informed that the Office for Outer Space Affairs, as the executive secretariat of ICG, was responsible for the coordination of the meetings of ICG and its Providers' Forum, which were held in conjunction with sessions of the Committee and its subsidiary bodies. It was noted that the executive secretariat also maintained a comprehensive information portal for ICG and users of GNSS services.

131. The Subcommittee noted that, with education and capacity-building forming the core of the ICG programme on GNSS applications, and pursuant to the ICG workplan, the Office for Outer Space Affairs organized regional workshops, training courses and technical seminars and supported their follow-up projects in the use of GNSS-related technologies in various fields of science and industry, including space weather effects on GNSS.

132. The Subcommittee also noted that the regional centres for space science and technology education, affiliated to the United Nations, had started to use the education curriculum on global navigation satellite systems (ST/SPACE/59). The regional centres, which also served as information centres for ICG and its Providers' Forum, aimed to contribute to the creation of a knowledgeable workforce, which was necessary for the advancement of GNSS and its applications in the regions, particularly in developing countries.

133. The Subcommittee noted that the United Nations/Croatia Workshop on Applications of Global Navigation Satellite Systems had been held in Baška, Krk island, Croatia, from 21 to 25 April 2013. The Workshop was co-sponsored by the United States, through ICG. The Faculty of Maritime Studies of the University of Rijeka hosted the Workshop on behalf of the Government of Croatia. The Workshop was to develop a regional plan of action that would contribute to the wider use of GNSS technology and its applications, including the establishment of specific pilot projects in which interested institutions could work together at the national and/or regional level.

134. The Subcommittee noted with satisfaction that the eighth meeting of ICG and the eleventh meeting of the Providers' Forum, organized by the government of Dubai and hosted by the Emirates Institution for Advanced Science and Technology, had been held in Dubai, United Arab Emirates, from 9 to 14 November 2013. It was noted that the ninth meeting of ICG would be organized by the European Union and hosted by the European GNSS Agency in Prague, from 10 to 14 November 2014. The Subcommittee also noted the expression of interest by the United States in hosting the tenth meeting of ICG, in 2015.

135. The Subcommittee noted that the ICG working groups focused on the following issues: compatibility and interoperability; enhancement of the performance of GNSS services; information dissemination and capacity-building; and reference frames, timing and applications. The Subcommittee also noted that

the working groups had made substantive progress in furthering the workplans of ICG and its Providers' Forum, in particular with regard to the detection and mitigation of interference.

136. The Subcommittee noted that ICG had established the International GNSS Monitoring and Assessment Task Force in order to focus on identifying service parameters that should be monitored and to define the level of monitoring and methods for carrying it out. Consensus was also reached on the fact that achieving a fully interoperable GNSS space service volume would provide significant performance benefits that no single system could provide on its own.

137. The Subcommittee commended the Office for Outer Space Affairs on its outstanding performance in its capacity as the executive secretariat of ICG and its Providers' Forum, and expressed appreciation for the efforts of the Office in promoting the use of GNSS through its programme on GNSS applications.

138. The Subcommittee noted with appreciation the financial contributions made by the United States and the European Commission to the Office for Outer Space Affairs in support of GNSS-related activities and ICG and its Providers' Forum.

139. The Subcommittee noted that the Global Positioning System (GPS) of the United States continued to set a high standard of reliability, accuracy and service to the international community. It was noted that GPS had 31 operational satellites in orbit to ensure a baseline constellation of 24 plus 3 satellites to provide better coverage and availability around the world. It was also noted that seven of the Block IIR-M satellites and four Block IIF satellites were broadcasting a second civil-use signal called "L2C". The IIF satellites were also broadcasting a civil-use signal on the L5 frequency, which would be used for safety-of-life applications.

140. The Subcommittee noted that the improved accuracy of the Wide Area Augmentation System enabled the United States Federal Aviation Administration to develop the localizer performance with vertical guidance (LPV) approach. It was noted that more than 60,000 aircraft and their operators were benefiting from the increased safety and capacity provided through the implementation by the United States of the satellite-based augmentation systems.

141. The Subcommittee noted the intention of the United States to continue improving the accuracy and availability of GPS through improved satellite and clock performance and modernized satellites, and to broadcast GPS signals free of direct user charges. It was noted that the United States was committed to keeping GPS as a central pillar in an emerging international system of GNSS and that, as new systems emerged, signal compatibility and interoperability among GNSS, as well as transparency in the provision of open civil services, would be key factors in ensuring that civil users around the world received the maximum benefit from GNSS applications.

142. The Subcommittee noted that the Russian Federation's Global Navigation Satellite System (GLONASS) constellation currently consisted of 29 satellites in orbit. The Subcommittee also noted that infrastructure, built within the scope of the Emergency Road Assistance based on Global Navigation Satellite Systems project (ERA-GLONASS), would serve as the foundation for the development of navigation information systems, services, and equipment based on GLONASS technology in the Russian Federation, with benefits for all categories of users.

143. The Subcommittee noted a series of successful launches as part of China's Beidou satellite navigation system and that the system had started providing initial positioning, navigation and timing services in the Asia-Pacific region. It was also noted that the Beidou ground-based enhancement system would help to improve Beidou's position accuracy and the reliability and integrity of its services, in order to meet the demands of civil aviation and other users.

144. The Subcommittee noted that India was currently implementing two paths in its satellite navigation programme: the GPS-aided GEO-augmented Navigation System (GAGAN), a satellite-based augmentation system; and the Indian Regional Navigation Satellite System (IRNSS), an independent regional system. It was noted that GAGAN had been established to provide increased position accuracy for civil aviation applications and better air traffic management, and that the availability of GAGAN signal-in-space would bridge a major part of the gap between the coverage areas of the European Geostationary Navigation Overlay Service (EGNOS) and Japan's Multi-functional Transport Satellite (MTSAT) Satellite-based Augmentation System (MSAS), thereby offering seamless navigation coverage to the aviation industry.

145. The Subcommittee also noted that IRNSS, to consist of a constellation of seven satellites, three of which are to be placed in geostationary Earth orbit and four in geosynchronous orbit, was in the implementation phase. The first IRNSS satellite was launched on 1 July 2013, and the full constellation was expected to be completed in 2015.

146. The Subcommittee noted that the formal operation of the Quasi-Zenith Satellite System (QZSS) of Japan was planned to begin in 2018, and that a constellation of seven satellites would be completed to improve positioning in the Asia-Pacific region, including the improvement of the capacity to respond to natural disasters. It was also noted that eight multi-GNSS application experiments, aimed at improving the position accuracy of multi-GNSS and QZSS, had been carried out in the region.

147. The Subcommittee noted that the Government of Canada had created the Federal Global Navigation Satellite Systems Coordination Board, with a three-year mandate, with the objective of fostering collaboration among the various departments of the Government and addressing issues related to the protection of the GNSS spectrum, in particular the detection and mitigation of local interference in Canada.

148. The Subcommittee noted with appreciation that Egypt and Mexico had reported on their projects and activities focused on helping to bring GNSS technology to the widest user community possible, as well as their participation in the programmes conducted by international partners.

VIII. Space weather

149. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 11, "Space weather".

150. The representatives of Canada, China, Egypt, Germany, Japan, Pakistan, the Republic of Korea, the Russian Federation, Switzerland and the United States made

statements under agenda item 11. During the general exchange of views, statements relating to the item were made by representatives of other member States.

151. The Subcommittee heard the following scientific and technical presentations:

(a) "Canadian space weather science and research: from discovery to operations", by the representative of Canada;

(b) "International Centre for Space Weather Science and Education (ICSWSE) of Kyushu University", by the representative of Japan;

(c) "The use of space technologies for the implementation of space data infrastructure of the Ministry of Agriculture (IDE-MINAGRI) of Chile", by the representative of Chile;

(d) "Space weather services: building resilience through international partnerships", by the representative of the United States;

(e) "The use of the global navigation satellite systems for space weather: the Italian case", by the representative of Italy;

(f) "A geophysical approach to assess space weather impacts on Earth", by the representative of Brazil;

(g) "Austrian contributions to the European Space Agency's space situational awareness space weather programme: real-time detection of solar eruptions and space weather effects on board aircraft", by the representative of Austria;

(h) "Advances in Canada's contributions to space situational awareness", by the representative of Canada;

(i) "Highlights of the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP) Climate and Weather of the Sun-Earth System, phase II (CAWSES II) scientific program (2009-2013)", by the observer for SCOSTEP;

(j) "Variability of the Sun and its terrestrial impact (VarSITI) — Scientific Committee on Solar-Terrestrial Physics (SCOSTEP) new scientific programme (2014-2018)", by the observer for SCOSTEP.

152. The Subcommittee had before it the report on the United Nations/Austria Symposium on Space Weather Data, Instruments and Models: Looking Beyond the International Space Weather Initiative, held in Graz, Austria, from 16 to 18 September 2013 (A/AC.105/1051).

153. The Subcommittee noted that progress had been made over the past year in advancing space weather capability, both nationally and internationally. It was noted that efforts to monitor the Sun and near-Earth space, to perform research to improve prediction, and to develop and deliver real-time services were of importance to the international community. It was also noted that space weather involved global phenomena driven by large solar eruptions that impact large areas of the Earth simultaneously. It was important, therefore, to monitor and to understand the drivers of space weather, as well as the impacts on Earth and in space.

154. The Subcommittee noted with appreciation that Canada, China, Egypt, Germany, Japan, Pakistan, the Republic of Korea, the Russian Federation, Switzerland, the United States, SCOSTEP and the Office for Outer Space Affairs

had reported on their achievements, projects, international space weather programmes and the activities that they had carried out in 2013 for a better understanding of the ionosphere and the impacts of space weather on Earth. For example, there had been substantial progress in the observation of the equatorial ionosphere, solar transients, energetic particles from space, as well as space weather effects on GNSS.

155. The Subcommittee noted that new space missions and ground-based instrumentation would ultimately provide data that could substantially improve space weather predictions.

156. The Subcommittee noted that the expert meeting on improving space weather forecasting in the next decade, held on the margins of its current session, had brought together international scientists currently working in space weather research to discuss the paths for improvement of space weather forecasting during the next decade. The Subcommittee also noted the following recommendations made by the expert meeting:

(a) Recognizing the success of observations in recent projects and the critical information gained from them, it was suggested that there was an urgent need to ensure that there was continued access to observations of transients in the inner heliosphere, in particular, the Earth-directed events;

(b) A capability for sharing and hosting of data from space- and ground-based instruments relevant for space weather research and forecasting facilitated via the existing virtual observatories should be encouraged;

(c) The deployment of new instruments and instrument arrays, along with the accompanying education and public outreach, should be continued;

(d) The development of improved forecasting and "nowcasting" capabilities, including for space weather at other planets, with special emphasis on supporting robotic exploration, should be supported.

157. The Subcommittee expressed its gratitude to the Office for Outer Space Affairs for its support in organizing the expert meeting.

IX. Near-Earth objects

158. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 12, "Near-Earth objects".

159. The representatives of Canada, Egypt, Germany, Italy, Japan, the Republic of Korea and the United States, as well as the representative of Chile, on behalf of the Group of Latin American and Caribbean States, made statements under the agenda item. During the general exchange of views, statements relating to the item were also made by representatives of other member States and by the observers for ESA, SGAC and SWF.

160. The Subcommittee heard the following scientific and technical presentations:

(a) "Near-Earth objects 2013", by the representative of the United States;

(b) "Near-Earth objects activities in Russia: current state", by the representative of the Russian Federation;

(c) "Chelyabinsk event: what we know one year later", by the representative of the Czech Republic;

(d) "The Asteroid Grand Challenge", by the representative of the United States.

161. The Subcommittee noted with appreciation the work of the Action Team on Near-Earth Objects under the chairmanship of Sergio Camacho (Mexico) for the progress made on coordinating international efforts for the mitigation of the near-Earth object (NEO) hazard threat.

162. The Subcommittee noted that effective responses for the mitigation of hazard threats from NEOs were best carried out by means of international cooperation and the coordination of related research and knowledge of best practices.

163. The Subcommittee also noted the importance of information-sharing in discovering, monitoring and physically characterizing potentially hazardous NEOs to ensure that all countries, in particular developing countries with limited capacity in predicting and mitigating an NEO impact, were aware of potential threats. The Subcommittee also recalled the importance of capacity-building for effective emergency response and disaster management in the event of an NEO impact.

164. The Subcommittee noted that in its resolution 68/75, the General Assembly had welcomed with satisfaction the recommendations for an international response to the near-Earth object impact threat (A/AC.105/1038, annex III, paras. 11-14), endorsed by the Scientific and Technical Subcommittee at its fiftieth session and by the Committee at its fifty-sixth session.

165. The Subcommittee recalled that at its fiftieth session, its Working Group on Near-Earth Objects had recommended the following:

(a) An international asteroid warning network (IAWN), open to contributions by a wide spectrum of organizations, should be established by linking together the institutions that were already performing, to the extent possible, the necessary functions;

(b) IAWN should interface with the relevant international organizations and programmes to establish linkages with existing national and international disaster response agencies in order to study and plan response activities for potential NEO impact events;

(c) A space mission planning advisory group (SMPAG) should be established by States Members of the United Nations that have space agencies. The group should include representatives of spacefaring nations to lay out the framework, timeline and options for initiating and executing space mission response activities.

166. The Subcommittee recalled that it had agreed that the work of IAWN and SMPAG should be facilitated by the United Nations.

167. The Subcommittee noted that the Action Team on Near-Earth Objects, established by the Committee on the Peaceful Uses of Outer Space in 2001, should assist in the establishment of IAWN and SMPAG and that the Action Team should inform the Subcommittee of the progress in the establishment of both groups. Once established, IAWN and SMPAG should report on an annual basis on their work.

168. The Subcommittee recalled that all recommendations should be implemented with no cost to the regular budget of the United Nations.

169. The Subcommittee also noted that in implementing the above recommendations, the Action Team on Near-Earth Objects, in collaboration with NASA and ESA, had organized two meetings in 2014 to formally establish IAWN and SMPAG.

170. In accordance with the recommendations, the Subcommittee invited the Chair of the Action Team to inform the Subcommittee of the progress in the establishment of IAWN and SMPAG.

171. The Subcommittee was informed that on 13 and 14 January 2014, the first meeting of the steering committee of IAWN had been hosted by the Minor Planet Center, at the Harvard-Smithsonian Center for Astrophysics in Cambridge, United States. At that meeting, the core membership of an ad hoc steering committee was established, comprising individuals and institutions from the Russian Federation (Institute of Astronomy of the Russian Academy of Sciences), France (Centre national de la recherche scientifique (CNRS)), United States (NASA, the Jet Propulsion Laboratory and the Minor Planet Center), Germany (DLR), ESA and its Space Situational Awareness programme; the Netherlands Institute for Space Research (SRON), Italy (Institute for Space Astrophysics and Planetology) and the International Astronomical Union (IAU) and the Chair of the Action Team on Near-Earth Objects. SWF and the Solar System Exploration Research Virtual Institute (SSERVI) provided support to the meeting. After the meeting, the Korea Astronomy and Space Science Institute (KASI) indicated its intention to join IAWN. The Subcommittee was informed of the following results and findings of that meeting:

(a) The meeting provided an opportunity to hear directly from experts engaged in NEO discovery, tracking and characterization; to examine policies regarding threat threshold criteria; and to provide recommendations for communicating that information to the world's political leaders and the general population;

(b) The IAWN ad hoc steering committee recognized that there was a need to encourage additional participation in IAWN and, through the recruitment of other organizations, in the efforts of the network. Potential partners mentioned at the meeting included: the Russian Federal Space Agency (Roscosmos), the Japan Aerospace Exploration Agency (JAXA), ESO, the Canadian Space Agency, the Indian Space Research Organisation (ISRO), the China National Space Administration (CNSA), the UK Space Agency of the United Kingdom, the French Centre national d'études spatiales and the International Scientific Optical Network (ISON). Additional partners were encouraged to join;

(c) A statement of intent would be drafted to provide guidance on the operational principles of IAWN, to establish guidance by which IAWN would

operate and to acknowledge the participation of each partner in IAWN. The statement of intent would address the goals of the steering committee for the global NEO database and for communicating information to diverse audiences, including politicians, policymakers, the emergency management community and the population at large. The statement of intent will also define the basic roles and responsibilities of the steering committee of IAWN;

(d) IAWN should enhance NEO discovery and follow-up observations (e.g. astrometry, photometry and spectroscopy), especially in the southern hemisphere, through further international cooperation and coordination. Specifically, IAWN should encourage the coordinated use of ground-based telescopes for NEO follow-up observations, incorporate existing assets to bridge gaps in global sky coverage, and identify and facilitate the coordination of existing capabilities of members that could be utilized more effectively;

(e) Through further international collaboration, IAWN should seek to establish an international rapid all-sky search capability that was focused on discovering smaller, imminent impactors (e.g., the Chelyabinsk event or larger ones) and the development and operation of a space-based NEO infrared survey telescope to increase the rate of discovery of NEOs by at least an order of magnitude;

(f) The IAWN ad hoc steering committee agreed to organize a two-day workshop in 2014 on communication strategies regarding NEO impact hazards. The workshop would focus on the critical assessment of messages, strategies and plans developed by the NEO community in an effort to improve international communication relating to potentially hazardous asteroids and impact risks.

172. The Subcommittee was also informed that on 6 and 7 February 2014, in collaboration with the Action Team on Near-Earth Objects, ESA had hosted the first meeting of SMPAG at its European Space Operations Centre in Darmstadt, Germany. The representatives of the following entities participated: Agencia Espacial Mexicana (Mexico), Agenzia Spaziale Italiana (Italy), Centre national d'études spatiales (France), Canadian Space Agency (Canada), Chile, DLR (Germany), ESA, Ghana, JAXA (Japan), NASA (United States), Roscosmos (Russian Federation), State Space Agency of Ukraine (Ukraine) and UK Space Agency (United Kingdom). In addition, representatives of the Action Team on Near-Earth Objects and the Office for Outer Space Affairs were present. The participants agreed that a representative of ESA would chair the first meeting of SMPAG. After the meeting, Romania requested membership in SMPAG, appointing the Romanian Space Agency (ROSA) as its representative body, and announced its delegation. Other space agencies were encouraged to join. The Subcommittee was informed of the following information resulting from that meeting:

(a) The participants in the meeting noted that the primary purpose of SMPAG was to prepare an international response to a NEO threat through the exchange of information and the development of options for collaborative research and mission opportunities, and to conduct planning activities for NEO threat mitigation;

(b) In a round-table discussion, some members of SMPAG summarized the efforts of their respective space agencies in the field of NEOs. ESA presented a sample impact case to SMPAG in order to frame discussions relevant to the future work of SMPAG. That case study traced the possible time frame and the steps that

could be taken to assist in the disaster response. Participants in the meeting were then briefed on the outcomes of the first meeting of the IAWN ad hoc steering committee referred to above;

(c) The main work of SMPAG at the meeting was the consideration and finalization of its terms of reference. Consensus had been achieved as to the structure and wording of the terms of reference. During the meeting, ESA was elected by consensus as interim chair of SMPAG. The next meeting would be held in Vienna on 12 and 13 June 2014. That meeting would focus on the exchange of information on relevant activities in the field of NEO hazard mitigation and on the future workplan.

173. The Subcommittee noted that the Action Team on Near-Earth Objects should continue to support the work of IAWN and SMPAG in the short term in order to facilitate their interaction with the Committee and Governments, intergovernmental organizations and non-governmental organizations that were not participating in those NEO bodies. The Action Team would also address related issues that were not foreseen at present or were not dealt with by the two bodies. The continued need for the Action Team would be reviewed at each session of the Subcommittee.

X. Use of nuclear power sources in outer space

174. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 13, "Use of nuclear power sources in outer space".

175. The representatives of Mexico, the United States, Venezuela (Bolivarian Republic of) and the representative of Chile, on behalf of the Group of Latin American and Caribbean States, made statements under agenda item 13. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

176. The Subcommittee encouraged States and international intergovernmental organizations to begin or to continue implementing the Safety Framework for Nuclear Power Source Applications in Outer Space (A/AC.105/934).

177. The view was expressed that the Safety Framework would facilitate the conduct of such missions on a bilateral and multilateral basis between States and international intergovernmental organizations. The delegation expressing that view was also of the view that the widespread implementation of the Safety Framework would provide assurance to the global community that nuclear power source applications were being developed, launched and used in a safe manner.

178. The view was expressed that the Safety Framework, in its present form, was not adequate to meet the challenges posed by the use of nuclear power sources in outer space and that, in the regulation of the use of nuclear power sources in outer space, due consideration should be given to relevant norms of international law, the Charter of the United Nations and the United Nations treaties and principles on outer space. The delegation expressing that view was also of the view that there should be greater coordination and interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to develop binding legal instruments to define the responsibility of States in the use of nuclear power sources

in outer space and to undertake research on the ways and means of optimizing or substituting for the use of nuclear energy in outer space activities.

179. The view was expressed that encouraging national implementation of the Safety Framework should remain a high priority of the Subcommittee.

180. Some delegations expressed the view that more attention should be given to the safety of the use of nuclear power sources in outer space through adequate strategies, long-term planning, regulations and the promotion of binding standards, as well as the Safety Framework for Nuclear Power Source Applications in Outer Space.

181. Some delegations expressed the view that Governments bore international responsibility for national activities involving the use of nuclear power sources in outer space conducted by governmental and non-governmental organizations and that the matter concerned all humanity.

182. Some delegations expressed the view that more consideration should be given to the use of nuclear power sources in terrestrial orbits in order to address the problem of potential collisions of nuclear power source objects in orbit, as well as to their accidental re-entry into the Earth's atmosphere.

183. The view was expressed that the proliferation of nuclear power sources in outer space, including terrestrial orbits, should not be allowed, as the effects of the use of nuclear power sources on humankind and the environment had not been assessed and there was no definite framework establishing responsibilities and introducing technical and legal tools that could effectively address critical situations that might arise because of undue practices.

184. The view was expressed that the use of nuclear power sources in outer space should be as limited as possible and that, while nuclear power sources were needed for some interplanetary missions, no justification existed for their use in terrestrial orbits, for which other sources of energy were available that were much safer and had been proved to be efficient.

185. The view was expressed that the use of nuclear reactors in outer space should be limited to the means of propulsion and for use as an alternative source of energy (other than for propulsion) for operating scientific instruments and transmitting data for exclusively peaceful purposes.

186. Pursuant to General Assembly resolution 68/75, the Working Group on the Use of Nuclear Power Sources in Outer Space was reconvened under the chairmanship of Sam A. Harbison (United Kingdom). The Working Group held 4 meetings.

187. At its 812th meeting, on 20 February, the Subcommittee endorsed the report of the Working Group, including its amended multi-year workplan (see annex II, para. 9, to the present report).

XI. Long-term sustainability of outer space activities

188. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 14, "Long-term sustainability of outer space activities",

under the workplan contained in the report of the Committee on the Peaceful Uses of Outer Space on its fifty-second session.[1]

189. The representatives of Austria, Canada, China, Germany, Iran (Islamic Republic of), Japan, Pakistan, the Russian Federation, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 14. A statement was made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. The observer for SWF also made a statement. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

190. The Subcommittee heard the following scientific and technical presentations:

(a) "Small satellites: advancing university scientific research and workforce development", by the representative of the United States;

(b) "International perspectives on rendezvous and proximity operations in space and space sustainability", by the observer for SWF;

(c) "Public risk tolerability criteria for space launch and re-entry", by the observer for IAASS;

(d) "Commercial human spaceflight safety", by the observer for IAASS.

191. The Subcommittee had before it the following:

(a) Note by the Secretariat containing the compilation of draft guidelines proposed by expert groups A to D for consideration by the Working Group on the Long-term Sustainability of Outer Space Activities, as at the fifty-sixth session of the Committee on the Peaceful Uses of Outer Space (A/AC.105/1041/Rev.1);

(b) Working paper submitted by the Russian Federation on the long-term sustainability of outer space activities (A/AC.105/C.1/L.337);

(c) Working paper submitted by the Russian Federation on prerequisites for promoting the consideration of ways and means of maintaining outer space for peaceful purposes in the context of the issue of the long-term sustainability of outer space activities (A/AC.105/C.1/L.338);

(d) Working paper by the Chair of the Working Group containing a proposal for a draft report and a preliminary set of draft guidelines of the Working Group on the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/L.339);

(e) Conference room papers containing the working reports of expert groups A, C and D (A/AC.105/C.1/2014/CRP.13, A/AC.105/C.1/2014/CRP.15 and A/AC.105/C.1/2014/CRP.16);

(f) Conference room paper containing the views of the United States on the proposal for a draft report and a preliminary set of draft guidelines of the Working Group on Long-term Sustainability of Space Activities contained in document A/AC.105/C.1/L.339 (A/AC.105/C.1/2014/CRP.14);

(g) Conference room paper containing a working paper submitted by the Russian Federation on the long-term sustainability of outer space activities (basic

[1] *Official Records of the General Assembly, Sixty-fourth Session, Supplement No. 20* (A/64/20), para. 161.

elements of the concept of establishing a unified Centre for Information on Near-Earth Space Monitoring under the auspices of the United Nations and the most topical aspects of the subject matter) (A/AC.105/C.1/2014/CRP.17);

(h) Conference room paper containing a list of points of contact for the Working Group on the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/2014/CRP.18).

192. The Subcommittee welcomed the fact that General Assembly resolution 68/50 on transparency and confidence-building measures in outer space activities and the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (A/68/189) were made available at the session.

193. In accordance with General Assembly resolution 68/75, the Working Group on the Long-term Sustainability of Outer Space Activities was reconvened under the chairmanship of Peter Martinez (South Africa).

194. The Subcommittee welcomed the progress made under the agenda item within the Working Group and in the four expert groups, in accordance with the terms of reference and methods of work of the Working Group, and noted with appreciation that three expert groups had presented their working reports for consideration by the Working Group.

195. The Subcommittee noted that the proposal for a draft report and a preliminary set of draft guidelines, contained in the working paper prepared by the Chair of the Working Group, constituted an important step forward in the work of the Working Group and provided a solid basis for further discussions towards developing a consensus-based set of guidelines.

196. The view was expressed that the guidelines should be considered from a policy perspective in the Working Group.

197. Some delegations expressed the view that any measures or sets of guidelines that might be recommended in the future should be consistent with international law, including the five United Nations treaties on outer space.

198. The view was expressed that the guidelines should be in line with the legal principles on which activities in outer spaces are based, taking into account the non-placement of weapons in that environment.

199. The view was expressed that the regulation of space activities remained the responsibility of States and that that responsibility was not transferrable.

200. Some delegations expressed the view that it was important to consider the common elements in the work under way in the Working Group, the recommendations contained in the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (A/68/189) and the discussions on an international code of conduct, since they shared the goals of promoting safety, security and sustainability in outer space activities and were inherently interlinked.

201. The view was expressed that the complex issue of sustainability could be tackled only in an interdisciplinary manner.

202. Some delegations expressed the view that the recommendations and guidelines of the Working Group should not limit access to outer space by developing countries with emerging space capabilities wishing to exercise their legitimate right to use space technology for societal benefit and that States had to ensure that outer space was not used to favour commercial interests that undermined the social interests of humanity.

203. Some delegations expressed the view that the set of draft guidelines should be streamlined and consolidated into a more concise list.

204. The view was expressed that the structure of the draft set of guidelines could be greatly improved and that some new guidelines could be introduced.

205. The view was expressed that the guidelines should be clear and implementable, that their impact should be measurable, and that a clear path for their implementation should be considered already, at the present stage.

206. The view was expressed that a procedure for reviewing and updating the guidelines periodically should be set up.

207. The view was expressed that it was necessary to reach agreement on definitions for the terms used in the guidelines in order to ensure that the implementation of the guidelines had practical effect.

208. The view was expressed that the term "non-governmental organizations" should be used in the guidelines to refer to all space actors from academia, industry, the private sector and civil society.

209. The view was expressed that in the guidelines, instead of the term "non-governmental organizations", the term "non-governmental entities" should be used.

210. The view was expressed that capacity-building in countries with emerging space capabilities should be addressed more comprehensively, in particular in relation to space debris mitigation and space weather.

211. Some delegations expressed the view that space debris had been created through past space operations by countries with advanced space capabilities, and that those States should assist new entrants in space activities to mitigate space debris by providing scientific, technological and financial support, in order to assist them in taking into account the long-term sustainability of outer space activities.

212. The view was expressed that legal definitions for space debris and the status of space debris objects should be developed.

213. The view was expressed that an international space debris fund should be established to support activities in space debris mitigation and removal, and that Member States, in particular those with advanced space capabilities, should be encouraged to donate a percentage of their budget for space activities to the fund in order to support sustainable development on Earth and in outer space.

214. The view was expressed that a Centre for Information on Near-Earth Space Monitoring should be established as a universal tool for information exchange and for the collection and dissemination of information on objects and events in near-Earth space.

215. The view was expressed that the use of nuclear power sources in outer space and its direct implications on sustainability and safety had not been addressed in the work of the Working Group on the Long-term Sustainability of Outer Space Activities.

216. The Subcommittee noted that in accordance with the agreement reached by the Committee at its fifty-sixth session (A/68/20, para. 167), the Chair of the Working Group would inform the Legal Subcommittee at its fifty-third session of the progress achieved by the Working Group in the period leading up to and during the fifty-first session of the Scientific and Technical Subcommittee.

217. The view was expressed that the Committee should be able to submit a first set of guidelines for examination by the General Assembly in 2014, in accordance with the workplan of the Working Group, and that any topics requiring more profound consideration could be identified to constitute the basis of a new workplan on the long-term sustainability of outer space activities.

218. The view was expressed that given that the report of expert group B was not presented for examination at the current session of the Subcommittee, delegations could not study the guidelines proposed by expert group B on an equal basis.

219. Some delegations expressed the view that sufficient time should be secured for discussions of the Working Group in the plenary of the Subcommittee, with simultaneous interpretation services, and that States should allow themselves adequate time to consider and reach consensus on all issues.

220. The view was expressed that the Working Group should meet during the fifty-seventh session of the Committee and that expert groups could also be reconvened on the margins of that session as necessary.

221. The view was expressed that the method of work used in the Working Group should be considered for use under other agenda items, since tangible results had been achieved in the Working Group in a very limited time.

222. At its 813th meeting, on 20 February, the Subcommittee endorsed the report of the Working Group on the Long-term Sustainability of Outer Space Activities, which is contained in annex III to the present report.

XII. Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union

223. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 15, "Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and

interests of developing countries, without prejudice to the role of the International Telecommunication Union", as a single issue/item for discussion.

224. The representatives of Bolivia (Plurinational State of) and the Russian Federation and the representative of Chile, on behalf of the Group of Latin American and Caribbean States, made statements under agenda item 15. The observer for ITU also made a statement under the item. During the general exchange of views, statements relating to the item were made by representatives of member States.

225. The Subcommittee welcomed the information provided in the annual report for 2013 of the Radiocommunication Bureau of ITU on the use of the geostationary satellite orbit and other orbits (www.itu.int/ITU-R/space/snl/report/), as well as other documents referred to in conference room paper A/AC.105/C.1/2014/CRP.9. The Subcommittee invited ITU to continue to submit reports to it.

226. Some delegations expressed the view that the geostationary orbit was a limited natural resource that was at risk of becoming saturated, thereby threatening the sustainability of space activities in that environment; that its exploitation should be rationalized; and that it should be made available to all States, under equitable conditions, irrespective of their current technical capabilities, taking into particular account the needs of developing countries and the geographical position of certain countries. Those delegations were also of the view that it was important to use the geostationary orbit in compliance with international law, in accordance with the decisions of ITU and within the legal framework established in the relevant United Nations treaties.

227. Some delegations expressed the view that the geostationary orbit provided unique potential for access to communications and information, in particular for assisting developing countries in implementing social programmes and educational projects and for providing medical assistance.

228. Some delegations expressed the view that this item should remain on the agenda of the Subcommittee and that its study could be carried out, as necessary, by working groups or intergovernmental panels in order to ensure the use of the geostationary orbit in accordance with international law.

229. The Subcommittee noted the experience of member States in their research of technical methods aimed at easing access for all States to the spectrum/orbital resources of the geostationatry orbit. In that regard, the Subcommittee noted the proposal to increase the maximum permissible levels of interference between fixed satellite service networks within non-planned frequency bands in the orbit.

230. The Subcommittee congratulated the Plurinational State of Bolivia on the launch into geostationary orbit of its telecommunications satellite, Túpac Katari (TKSat), which was carried out at the Xichang Satellite Launch Center, China, on 20 December 2013.

XIII. Draft provisional agenda for the fifty-second session of the Scientific and Technical Subcommittee

231. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 16, "Draft provisional agenda for the fifty-second session of the Scientific and Technical Subcommittee".

232. The Subcommittee noted that the Secretariat had scheduled the fifty-second session of the Subcommittee to be held from 2 to 13 February 2015.

233. The Subcommittee noted that, in accordance with General Assembly resolution 68/75, it would submit to the Committee its proposal on the draft provisional agenda for the fifty-second session of the Subcommittee and recommended that the following substantive items be included in the draft provisional agenda:

1. General exchange of views and introduction of reports submitted on national activities.
2. United Nations Programme on Space Applications.
3. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda.
4. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment.
5. Space debris.
6. Space-system-based disaster management support.
7. Recent developments in global navigation satellite systems.
8. Space weather.
9. Near-Earth objects.
10. Use of nuclear power sources in outer space.

    (Work for 2015 as reflected in the extended multi-year workplan of the Working Group (see para. 187 and annex II, para. 9, to the present report of the Subcommittee))

11. Long-term sustainability of outer space activities.

    (Extension of the workplan of the Working Group to be considered by the Committee at its fifty-seventh session)

12. Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union.

    (Single issue/item for discussion)

13. Draft provisional agenda for the fifty-third session of the Scientific and Technical Subcommittee, including identification of subjects to be dealt with as single issues/items for discussion or under multi-year workplans.

234. The Subcommittee agreed that the topic for the symposium to be organized in 2015 by the Committee on Space Research, in accordance with the agreement reached by the Subcommittee at its forty-fourth session, in 2007 (A/AC.105/890, annex I, para. 24), should be "Measuring the universe: looking back in time with modern astronomy".

Annex I

Report of the Working Group of the Whole

1. In accordance with paragraph 7 of General Assembly resolution 68/75, the Scientific and Technical Subcommittee, at its fifty-first session, reconvened its Working Group of the Whole. From 12 to 20 February 2014, the Working Group held 5 meetings, under the chairmanship of V. K. Dadhwal (India). The Working Group considered the item on space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda, and the draft provisional agenda for the fifty-second session of the Subcommittee, to be held in 2015. At its 5th meeting, on 20 February, the Working Group adopted the present report.

I. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda

2. For its consideration of the item on space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda, the Working Group had before it the documents referred to under item 6 of the agenda of the Subcommittee (see para. 60 in the main body of the report above).

3. The Working Group welcomed the proposal made by Japan (A/AC.105/2014/CRP.22) and agreed with its overall objective. The Working Group agreed on the following requirements:

(a) Considering that the Open Working Group of the General Assembly on Sustainable Development Goals still had to finalize its proposal for concrete sustainable development goals to the General Assembly at its sixty-ninth session, in 2014, and that the post-2015 development agenda process was yet to become concrete and implementable, the Working Group of the Whole would, at the fifty-second session of the Scientific and Technical Subcommittee, in 2015, review the multi-year workplan contained in that conference room paper in order to define a detailed method of work for the period 2015-2019 on the basis of what was expected to be the outcome of those two global processes under the global development agenda;

(b) The goal of that multi-year workplan would be to identify how the Committee on the Peaceful Uses of Outer Space was contributing to the global development agenda, including interaction with intergovernmental and non-governmental organizations, regional and interregional mechanisms for cooperation in space activities and other institutional frameworks for international space cooperation. The contribution of the Committee to the United Nations Conference on Sustainable Development (Rio+20), contained in document A/AC.105/993, would be the basis for such determination;

(c) The method of work under the multi-year workplan would, against that background, be revisited by the Working Group of the Whole at the fifty-second

session of the Subcommittee. The Secretariat was requested to present for the Subcommittee's fifty-second session, in consultation with the delegation of Japan, a conference room paper outlining a proposed method of work under the multi-year workplan for consideration by the Working Group of the Whole, taking into account the status of the two parallel global processes in New York and the role of the outcome document of the United Nations Conference on Sustainable Development (Rio+20), in view of the forthcoming sustainable development goals and the post-2015 development agenda process;

(d) Consultations would be held at the fifty-seventh session of the Committee on the Peaceful Uses of Outer Space, in June 2014, in conjunction with the agenda item "Space and sustainable development".

4. The Working Group encouraged member States of the Committee to liaise nationally with their respective authorities and departments responsible for the intergovernmental processes related to the Conference and the post-2015 development agenda in order to promote the recognition in those processes of the relevance of space science and technology applications and the use of space-derived geospatial data.

5. The Working Group requested the Office for Outer Space Affairs to continue taking an active part in the United Nations System Task Team on the Post-2015 United Nations Development Agenda and other inter-agency mechanisms for the processes related to the United Nations Conference on Sustainable Development and the post-2015 development agenda, within its capacities, in order to promote the inclusion of space-related references and elements in the documentation generated by the United Nations Secretariat under those processes.

6. On the basis of a proposal by the delegation of Canada, the Working Group agreed on the establishment of a focused expert group on space and global health to consider issues related to the use of space technology for public health, and further agreed that the group should present, under the leadership of Canada, its method and programme of work, including a concrete timeline, to the Working Group of the Whole for its consideration at the next session of the Subcommittee, in 2015. The Working Group noted that no Secretariat services would be required for the focus expert group.

II. Draft provisional agenda for the fifty-second session of the Scientific and Technical Subcommittee

7. The Working Group of the Whole noted that, in accordance with General Assembly resolution 68/75, the Scientific and Technical Subcommittee would submit to the Committee its proposal for the draft provisional agenda for the fifty-second session of the Subcommittee, to be held in 2015.

8. The Working Group of the Whole considered the list of substantive items contained in the provisional agenda for the fifty-first session of the Subcommittee (A/AC.105/C.1/L.332) and recommended that the same substantive items should be considered at the fifty-second session of the Subcommittee.

9. The Working Group of the Whole noted that, in accordance with the agreement reached by the Subcommittee at its forty-fourth session, in 2007 (A/AC.105/890,

annex I, para. 24), the Committee on Space Research would organize a symposium at the fifty-second session of the Subcommittee. The Working Group of the Whole agreed that the topic of the 2015 symposium, chosen from a list of topics proposed by the Committee on Space Research, should be "Measuring the universe: looking back in time with modern astronomy".

10. The Working Group of the Whole agreed that an expert group with a rapporteur be set up to inform the Subcommittee on developments under the agenda item on space weather, drawing on the best practices of the work of expert group C on space weather of the Working Group on the Long-term Sustainability of Outer Space Activities. The Working Group of the Whole noted that under the leadership of Canada, the programme of work of the newly established expert group would be presented to the Subcommittee at its next session, in 2015. The Working Group of the Whole further noted that no Secretariat services would be required for the expert group.

Annex II

Report of the Working Group on the Use of Nuclear Power Sources in Outer Space

1. At its 796th meeting, on 10 February 2014, the Scientific and Technical Subcommittee reconvened its Working Group on the Use of Nuclear Power Sources in Outer Space, under the chairmanship of Sam A. Harbison (United Kingdom of Great Britain and Northern Ireland).

2. The Working Group recalled the objectives of its multi-year workplan for the period 2010-2015, adopted by the Subcommittee at its forty-seventh session, in 2010 (A/AC.105/958, annex II, para. 7):

(a) To promote and facilitate the implementation of the Safety Framework for Nuclear Power Source Applications in Outer Space by providing information pertinent to challenges faced by member States and international intergovernmental organizations, in particular those considering or initiating involvement in applications of nuclear power sources (NPS) in outer space;

(b) To identify any technical topics for, and establish the objectives, scope and attributes of, any potential additional work by the Working Group to further enhance safety in the development and use of space NPS applications. Any such additional work would require the approval of the Subcommittee and would be developed with due consideration for relevant principles and treaties.

3. The Working Group, at its informal and formal meetings, considered the following:

(a) Paper submitted by the United States of America on defining the organizational structure that implements a space nuclear power source mission application (A/AC.105/C.1/L.334);

(b) Presentation submitted by the United Kingdom on space nuclear power systems, activities and programmes in the United Kingdom (A/AC.105/C.1/2014/CRP.19);

(c) Non-paper submitted by the Chair of the Working Group on possible next steps for the Working Group after completion of the current workplan;

(d) Presentation by the delegation of the United Kingdom on the status of safety and regulatory activities in the project Megawatt Highly Efficient Technologies for Space Power and Propulsion Systems for Long-duration Exploration Missions (MEGAHIT), funded by the European Commission under the Seventh Framework Programme for Research and Technological Development.

4. The view was expressed that it was important to continue consideration of the use of NPS in outer space in the Committee and its subsidiary bodies and that it was particularly essential to make a thorough assessment of consequences for the Earth, the near-Earth environment and celestial bodies in the case of possible incidents with the involvement of nuclear power sources in outer space.

5. The Working Group noted that the time constraints of the current workplan would not allow any additional experiences with the implementation of the Safety

Framework to be presented to the Working Group by any member States or international intergovernmental organizations.

6. Similarly, the Working Group noted that additional presentations could be provided by member States and international intergovernmental organizations with experience in space NPS development and applications to address the identified challenges.

7. The Working Group considered the non-paper by the Chairman and observed that more time was required to identify any technical topics for, and the objectives, scope and attributes of, any potential additional work by the Working Group to further enhance safety in the development and use of space NPS applications.

8. In accordance with its multi-year workplan (A/AC.105/958, para. 134, and annex II, para. 8), the Working Group reviewed the workplan under the arrangements for the year 2014, which required a determination, inter alia, whether the current workplan should be extended.

9. The Working Group, bearing in mind a number of considerations, including those reflected in paragraphs 5-7 above, recommended that the current multi-year workplan be extended to 2017 as follows:

2014 The Working Group will request the Secretariat (a) to invite member States and international intergovernmental organizations with experience in space NPS applications to provide further information in 2015 on their implementation of the Safety Framework and (b) to invite member States and international intergovernmental organizations considering or initiating involvement in space NPS applications to make presentations in 2015, during the meetings of the Working Group, summarizing their plans, progress to date and any challenges faced or foreseen in implementing the Safety Framework or specific elements thereof;

2015 Receive presentations, during the meetings of the Working Group, from member States and international intergovernmental organizations pursuant to the invitation extended in 2014. In its report to the Subcommittee, the Working Group will (a) summarize the presentations, (b) identify any significant challenges that should be addressed in presentations in 2016, and (c) discuss any technical topics relevant to potential additional work by the Working Group to further enhance safety in the development and use of space NPS applications;

2016 Determine whether the current workplan should be extended; if it is not to be extended, prepare a draft report with recommendations for potential future work to promote and facilitate implementation of the Safety Framework;

2017 If the workplan has not been extended, finalize the report and recommendations.

10. The Working Group also requested the Secretariat to schedule all presentations to be given under the invitation referred to above during the first week of the fifty-second session of the Subcommittee, in 2015.

11. The Working Group agreed to hold a teleconference during the summer of 2014 in order to review the replies received to the invitation referred to in paragraph 8 above and to plan its activities for the rest of 2014.

12. At its 4th meeting, on 20 February 2014, the Working Group adopted the present report.

Annex III

Report of the Working Group on the Long-term Sustainability of Outer Space Activities

1. In accordance with paragraph 7 of General Assembly resolution 68/75, the Scientific and Technical Subcommittee, at its fifty-first session, reconvened its Working Group on the Long-term Sustainability of Outer Space Activities.

2. The Working Group held five meetings, from 11 to 20 February 2014, under the chairmanship of Peter Martinez (South Africa).

3. In accordance with its terms of reference and methods of work, the Working Group had before it the following:

(a) Note by the Secretariat containing the compilation of draft guidelines proposed by expert groups A to D for consideration by the Working Group on the Long-term Sustainability of Outer Space Activities, as at the fifty-sixth session of the Committee on the Peaceful Uses of Outer Space (A/AC.105/1041/Rev.1);

(b) Working paper submitted by the Russian Federation on the long-term sustainability of outer space activities (A/AC.105/C.1/L.337);

(c) Working paper submitted by the Russian Federation on prerequisites for promoting the consideration of ways and means of maintaining outer space for peaceful purposes in the context of the issue of the long-term sustainability of outer space activities (A/AC.105/C.1/L.338);

(d) Working paper by the Chair of the Working Group containing a proposal for a draft report and a preliminary set of draft guidelines of the Working Group on the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/L.339);

(e) Conference room papers containing the working reports of expert groups A, C and D (A/AC.105/C.1/2014/CRP.13, A/AC.105/C.1/2014/CRP.15 and A/AC.105/C.1/2014/CRP.16);

(f) Conference room paper containing the views of the United States on the proposal for a draft report and a preliminary set of draft guidelines of the Working Group on the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/2014/CRP.14);

(g) Conference room paper containing a working paper submitted by the Russian Federation on the long-term sustainability of outer space activities (basic elements of the concept of establishing a unified Centre for Information on Near-Earth Space Monitoring under the auspices of the United Nations and the most topical aspects of the subject matter) (A/AC.105/C.1/2014/CRP.17);

(h) Conference room paper containing a list of points of contact for the Working Group on the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/2014/CRP.18).

4. At the first meeting of the Working Group, the Chair of the Working Group presented an outline for the work of the Working Group during the current session and a review of the progress made since the fiftieth session of the Subcommittee, in

February 2013. The Working Group noted that all four expert groups had met on the margins of the fifty-sixth session of the Committee, in June 2013, and that expert groups A, B and D had held informal coordination meetings on the margins of the sixty-fourth International Astronautical Congress, held in Beijing in September 2013.

5. The Chair then invited the co-chairs of the four expert groups to introduce the work of the expert groups and their respective working reports, which had been made available in conference room papers, in accordance with the agreement of the Committee at its fifty-sixth session (A/68/20, para. 165). The Working Group noted that expert groups A, C and D had finalized their reports, and that expert group B would continue informal consultations on its working report with a view to meeting on the margins of the fifty-seventh session of the Committee to finalize its working report.

6. At the second meeting of the Working Group, the Chair introduced the working paper containing a proposal for a draft report and a preliminary set of draft guidelines of the Working Group on the Long-term Sustainability of Outer Space Activities, prepared by the Chair of the Working Group (A/AC.105/C.1/L.339), and invited delegations to provide their comments on the proposal. The Working Group noted that some delegations had provided comments on the document before the current session of the Subcommittee and that those comments had been circulated to the national points of contact and uploaded on the dedicated web page for the long-term sustainability of outer space activities on the website of the Office for Outer Space Affairs.

7. The Working Group noted that the draft guidelines contained in the working paper by the Chair had been put forward as they had been proposed by the expert groups in order to allow the Working Group to consider each guideline adequately before any attempt to consolidate the guidelines or otherwise change their structure or language was made.

8. The Working Group also noted that the focus of the deliberations on the set of draft guidelines was shifting from the expert groups to the Working Group and that the Working Group would take into account the valuable inputs of the expert groups in its continued work on developing the set of draft guidelines. The Working Group further noted that the Chair would continue to consult the expert group co-chairs concerning the incorporation of the work of the expert groups into the Working Group and that the experts could continue to support their national delegations as the consideration of the draft guidelines continued in the Working Group.

9. At the third meeting of the Working Group, the exchange of views on the working paper prepared by the Chair continued. Proposals contained in conference room papers A/AC.105/C.1/2014/CRP.14 and A/AC.105/C.1/2014/CRP.17 were presented by the respective delegations putting forward those proposals. Delegations shared their views on the structure of the working paper by the Chair, on the possible consolidation of the set of draft guidelines and on the workplan of the Working Group.

10. At its fourth meeting, the Working Group noted that informal consultations had been held by the Chair with interested delegations during the current session. During those consultations, proposals for the consolidation of the existing set of draft guidelines and the timeline for the way forward had been discussed.

11. At its fourth meeting, the Working Group had before it a non-paper prepared by the Chair containing a proposal for a structure for the consolidation of the set of draft guidelines. The Working Group noted that the structure had been developed on the basis of statements and comments made and proposals put forward by delegations during the current session of the Subcommittee.

12. The Working Group agreed that, on the basis of the structure contained in the non-paper, and taking into consideration the views expressed by delegations at the fourth meeting of the Working Group, the Chair would prepare a conference room paper containing a proposal for the consolidation of the set of draft guidelines, for consideration at the fifty-seventh session of the Committee.

13. The Working Group noted that in preparing the proposal for the consolidation of the set of draft guidelines, the Chair would consult with the co-chairs of the four expert groups to ensure that the originally intended scope, application, substance and effect of the draft guidelines, as identified by the expert groups, was preserved.

14. The Working Group noted that the conference room paper, to be prepared by the Chair for the fifty-seventh session of the Committee, would serve as a basis for discussions on a draft report of the Working Group, to be developed following the fifty-seventh session of the Committee, taking into account inputs received from delegations and decisions taken by the Working Group at that session. The draft report of the Working Group would be made available to delegations in the six official languages of the United Nations before the start of the fifty-second session of the Scientific and Technical Subcommittee, in February 2015.

15. The Working Group noted that the Chair would liaise with interested delegations concerning consultations to address questions relating to the terminology used in the draft guidelines, in the six official languages of the United Nations, and that the Chair would present a proposal for such consultations to the Working Group at the fifty-seventh session of the Committee.

16. The Working Group noted that the Chair had encouraged delegations intending to introduce proposals for substantive amendments to the existing draft guidelines within the structure proposed by the Chair, or proposals for new guidelines, to submit such proposals to the Secretariat in a timely fashion in order to ensure that submissions would be available in all official languages of the United Nations at the fifty-seventh session of the Committee. Timely submission of proposals would facilitate the comprehensive consideration by the Working Group of all aspects of the long-term sustainability of outer space activities and the development of a draft report of the Working Group.

17. The Working Group agreed that the findings contained in the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (A/68/189) would be considered by the Working Group at the fifty-seventh session of the Committee, with a view to identifying interlinkages in the recommendations contained in that report and in the work under way in the Working Group, as well as elements that could be taken into consideration in the development of guidelines by the Working Group.

18. The Working Group noted that the Chair would request the Committee to consider, at its fifty-seventh session, an extension of the workplan of the Working Group.

19. The Working Group noted that, in accordance with the agreement of the Committee at its fifty-sixth session, the Chair of the Working Group would inform the Legal Subcommittee at its fifty-third session of the progress achieved by the Working Group in the period leading up to and during the fifty-first session of the Scientific and Technical Subcommittee.

20. The Working Group agreed that the Chair of the Working Group would consult with the Chair of the Committee and the Secretariat regarding the scheduling of the fifty-seventh session of the Committee so as to allow the possibility for the Working Group to meet during that session, benefiting from interpretation services.

21. At its fifth meeting, on 20 February 2014, the Working Group adopted the present report.